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**From:** Vandenberg, John  
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**Subject:** Gold King - screening analysis and Scenarios

Tom,

NCEA staff (notably Lynn Flowers, Linda Phillips and Jackie Moya) have worked up a spreadsheet to derive noncancer screening level values for water and sediment consumption of the various metals present in the Gold King site, using the available data and most of the R8 analysis/assumptions. An important difference is that R8 combined adults and children; we are doing separate analyses for a 10 year old child and adult. We're doing QA now, and hopefully will be able to provide this to you tomorrow.

At this point our screening values are not identical to R8 results but are generally within a factor of 2-3, with some higher and others lower. The biggest discrepancy is for arsenic in sediment; R8 used site-specific adjustments for bioavailability for arsenic and lead and we are not aware of the data they used for this analysis. An initial sensitivity analysis has been done e.g., to evaluate different age groups and this has little effect on the results. The two parameters likely to affect the screening levels are intake rate for sediment and water, and exposure frequency (R8 used 64 days).

This information can generally address the question: Are current water column and sediment measurements below noncancer health screening values?

If desired, with some revisions that we are working on the spreadsheet can also be the basis for risk screening. Here are some scenarios for consideration, any input on these would be very helpful to address the question: What is the potential noncancer risk to people exposed to the water and sediment?

Scenario 1: recreational user (kayak/rafter): 10 days exposure at maximum concentration in

water and sediment, 54 days at no additional (background) exposure. (background levels of the metals are unknown to us, we can assume zero above background exposures or be provided with background levels if available). [[I now find the data was provided, we'll look at this]]

Scenario 2: recreational user (swimmer, festival participant): 2 days exposure at current (or some average) concentration in water and sediment, 62 days at no additional exposure.

Scenario 3: tribal member (oral exposure to unfiltered water, child playing at riverside): 3 days at high then rapidly declining (or some average) concentration in water; 64 days exposure to (declining, average or some assumed level of contaminant) in sediment. We don't know the levels to include for this analysis but could make reasonable assumptions based on current or average concentration levels (or better, trends) to calculate this hazard index.

Suggestions to refine these scenarios, or alternative scenarios, are most welcome (if so desired).

As discussed earlier, there are many assumptions involved in these analyses and it is for non-cancer endpoints only, not considering the potential for synergetic effects from mixtures exposures, carcinogenic effects, or at-risk populations such as women who are pregnant.

We also are developing a paragraph regarding the potential for risks from dermal exposure. We should have a draft in the morning.

Please let us know if you have any questions or requests.

John

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